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FARMERS' BULLETIN No. 1442

STORAGE OF SWEET POTATOES

THE STORAGE OF SWEET POTATOES is a sound economic practice which stabilizes the industry and makes the crop available over the greater portion of the year.

Satisfactory storage is dependent upon sweet potatoes that are well matured and carefully handled; moreover, they must be cured after being placed in the house and kept at a uniform temperature while in storage.

A substantial and satisfactory house for the storage of sweet potatoes can be built at moderate cost. If some existing building is available it is usually possible to alter it so as to make it suitable for this purpose.

This bulletin is a revision of and supersedes Farmers' Bulletin 970, "Sweet-Potato Storage."

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STORAGE OF SWEET POTATOES[1]

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IMPORTANCE OF SWEET-POTATO STORAGE

SWEET-POTATO STORAGE is a sound economic practice which makes the product available over a large portion of the year and in many cases obviates the necessity of selling the crop as soon as harvested, when prices are often low.

According to available statistics, more than 3,000 commercial sweet-potato storage houses are in use throughout the producing regions of the country. These have a capacity of about 12,000,000 bushels, a quantity sufficient to have a stabilizing effect on the industry and to make this nutritious vegetable available when it can not be supplied directly from the fields.

ESSENTIALS OF GOOD STORAGE

To keep sweet potatoes in good condition they must be (1) well matured before digging, (2) carefully handled, (3) well dried or cured after being put in the house, and (4) kept at a uniform temperature after they are cured.

The grower can judge when his sweet potatoes are ripe by breaking or cutting one of them and leaving it exposed to the air for a few minutes. The cut or broken surface dries if it is mature, but the surface remains moist if it is not ready to be dug. In regions where early frosts occur the potatoes should be dug about the time the first hard frost is expected, regardless of their stage of maturity.

The second essential, careful handling, should be observed in digging, gathering, hauling, and unloading. Sweet potatoes should be sorted in the field and gathered in padded baskets or boxes to prevent bruising or breaking the skin. The baskets or boxes should be loaded on the wagon, hauled to the storage house, and the potatoes carefully placed in the bins. When they are to be hauled very far, a wagon with bolster springs should be used. Sweet potatoes should

[1] The plans and lists of materials presented were prepared by the Bureau of Public Roads of the United States Department of Agriculture.

never be thrown from one row to another, loaded loosely into a wagon body, or hauled in bags, because any such practice will bruise them and afford an opportunity for disease to enter.

The third and fourth essentials, thorough drying and a uniform temperature, may be secured in a storage house where artificial heat can be supplied. The house must be constructed in such a way that it can be thoroughly ventilated when necessary and yet be made nearly air tight in cold weather. These requirements are provided in the types of houses described in this bulletin.

It is good economy to build a substantial sweet-potato storage house, because it will last longer and require less attention than a cheap, poorly constructed one. It would be possible to keep the potatoes in a cheaper and less carefully constructed house, but the attention required and the additional fuel used would soon exceed

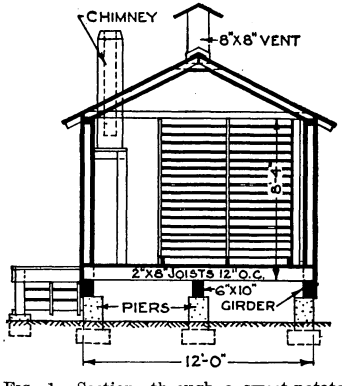

FIG. 1.—Section through a sweet-potato storage house, size 12 by 16 feet, having a capacity of 400 to 500 bushels in crates or 450 to 500 bushels in bulk, showing arrangement of bins

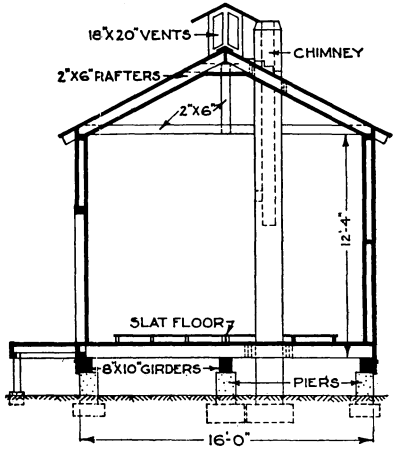

FIG. 2.—Section through a sweet-potato storage house, size 16 by 20½ feet, having a capacity of about 1,000 bushels in crates, showing various structural details

the cost of the extra labor and material necessary for building the better one. The chances of loss in a poorly built house are much greater than in one that is well built.

CONSTRUCTION OF SWEET-POTATO STORAGE HOUSES

Sweet-potato storage houses may be built of wood, brick, hollow tile, cement, or stone. Wooden houses are preferable, because they are usually cheaper and are easier to keep dry than the other types. It is difficult to keep moisture from collecting on the walls of a cement, stone, or brick house. Where such houses are built they should be lined with lumber, so as to keep the air in the house from coming in contact with the masonry walls. It is best to build sweet-potato storage houses on foundations that allow a circulation of air under them. The "dugout," or house built partly underground, is not satisfactory for storing sweet potatoes in the South, because it is practically impossible to keep this type of house dry, and moisture in the storage house will cause the crop to rot.

The foundation of the storage house may be in the form of piers or solid walls and should be of such a height that the floor is about on the level of the bottom of the wagon bed, while the footings should be carried below the frost line or to solid ground. Girders 6 by 10 to 10 by 12 inches in size are usually placed on the piers.

Where cement, brick, or stone foundation walls are built, they should extend 18 to 20 inches above the ground level, and plates 2 inches thick and 8 inches wide should be placed on the wall. In using walls for the foundation it is necessary to provide means for ventilation under the house. This can be done by placing small windows in the foundation every 10 to 12 feet. Even where solid outside foundation walls are used it is generally necessary to use piers for the center supports, as shown in Figures 1, 2, 3, 4, and 5.

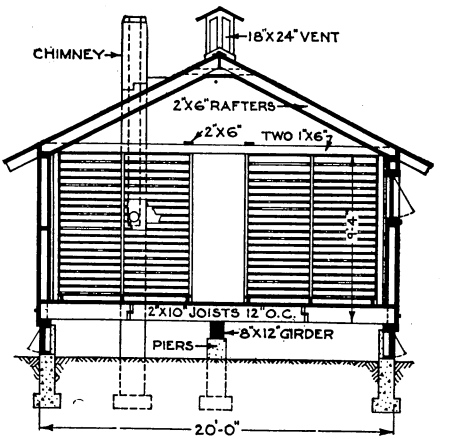

FIG. 3.—Section through a sweet-potato storage house, size 20 by 40 feet, having a capacity of 2,000 bushels in crates or 2,500 bushels in bulk, showing structural details

The principles of constructing storage houses of various sizes are very much the same; therefore, only one, the 12 by 16 foot house, will be described.

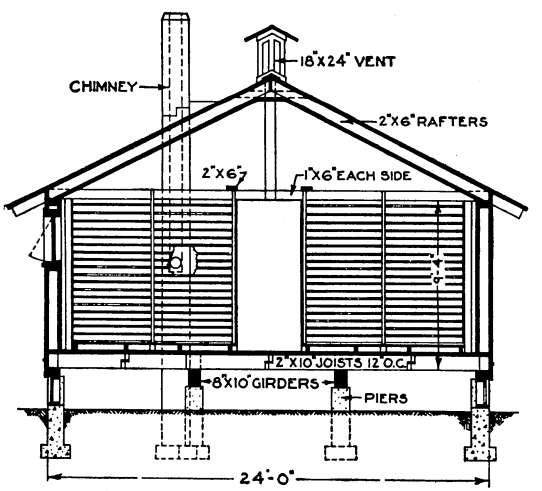

FIG. 4.—Cross section of a sweet-potato storage house, size 24 by 59½ feet, having a capacity of 4,000 bushels in crates or 5,200 bushels in bulk, showing the arrangement of bins and other structural details

For this small storage house, having a capacity of 400 to 500 bushels, build three rows of piers, one row under each side and one under the center of the house. Girders 6 by 10 inches in size are placed on the piers and on these 2 by 8 inch joists, spaced 12 inches apart from center to center. The walls of the storage house are made by setting 2 by 4 inch studs on the girders every 2 feet and nailing them to the floor joists. On the outside of the studs 1 by 6 inch boards are nailed diagonally to brace the wall; over these a layer of heavy building paper is tacked and matched siding then put on. A layer of 1 by 6 inch boards is nailed on the inside of the studding, then a layer of building paper, and over this matched boards. In

the lower South the first layer of boards on the inside of the studding may be omitted so far as the control of temperature is concerned, but in regions of high humidity (near the seacoast) it is deemed advisable to use four layers of boards, two on the inside and two on the outside of the frame, as suggested above. The tighter the walls, the less difficulty will be encountered in controlling both temperature and moisture. Two 2 by 4 inch pieces should be placed on top of the studding for eave plates, to which the rafters are nailed, as shown in Figure 2. The floor is made by laying 1 by 6 inch sheathing over the joists, then a layer of heavy building paper, and over this 1 by 4 inch tongue-and-groove flooring. The roof sheathing may be covered with shingles, roofing paper, galvanized iron, or any other kind of roofing material; but galvanized iron is to be preferred, because it is durable and lessens danger from fire. Use 2 by 4 inch scantling for rafters,

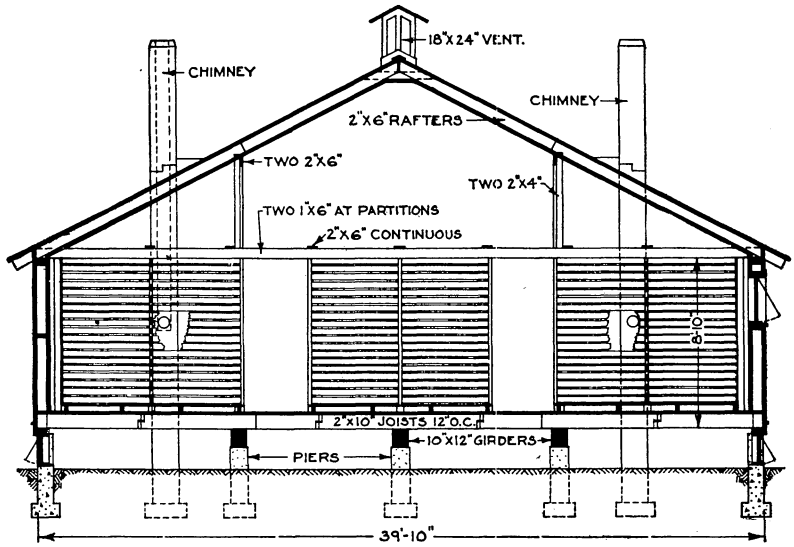

FIG. 5.—Cross section of a sweet-potato storage house, size 39 feet 10 inches by 100 feet 10 inches, having a capacity of 12,000 bushels in crates or 15,000 bushels in bulk, showing arrangement of bins and other structural details

and make the roof tight to keep out the cold. The rafters should be cut to fit over the plate at the lower end and to fit snugly against the ridgepole at the upper end. On the outside of the rafters put a layer of 1 by 6 inch sheathing, then a layer of building paper, then another layer of 1 by 6 inch sheathing, and over this the roofing material. On the inside of the rafters nail a layer of 1 by 6 inch sheathing, then a layer of heavy building paper, and over this a layer of matched boards.

The sides of the building should be tied together to prevent spreading. This can be done by nailing 2 by 4 inch pieces to the plates or to the lower ends of the rafters. It would be an advantage to have these pieces over the bin support.

The space between the walls should be left open, because any material used to keep out the cold will absorb moisture. Many storage houses have been built with sawdust, shavings, or similar

material between the walls, but this practice should never be followed. Sawdust will take up moisture and when once wet will never dry out. This moisture will keep the house damp and cause the walls to rot. The air space is a good insulator if the walls are made tight, and they will be tight if the plans illustrated in this bulletin are followed.

Thorough ventilation is necessary in a storage house. This is provided by means of windows, doors, and ventilators in the floor and through the roof, as shown in the various text figures in this bulletin. The openings in the floor around the stove prevent overheating the potatoes near the stove. The windows and doors must be made so as to close tightly to keep out the cold. All windows should be made to open from the outside or be fitted with devices for opening them from the inside. Where windows filled with glass are used, outside shutters are put on, as shown in Figure 6, and these should be well padded. Some of the windows should be made of glass, so as to admit light without letting in cold air, as it is necessary to have light when working in the house, and in cold weather the house should not be kept open. All of the openings must be made so they can be closed quickly and tightly whenever necessary. The ventilators in the roof should extend through the ceiling, so as to carry out the warm air as it arises. The location and size of the floor and ceiling ventilators are determined by the size of the house, its height, and the interior arrangement. The 12 by 16 foot 400 to 500 bushel house can be suitably ventilated by the

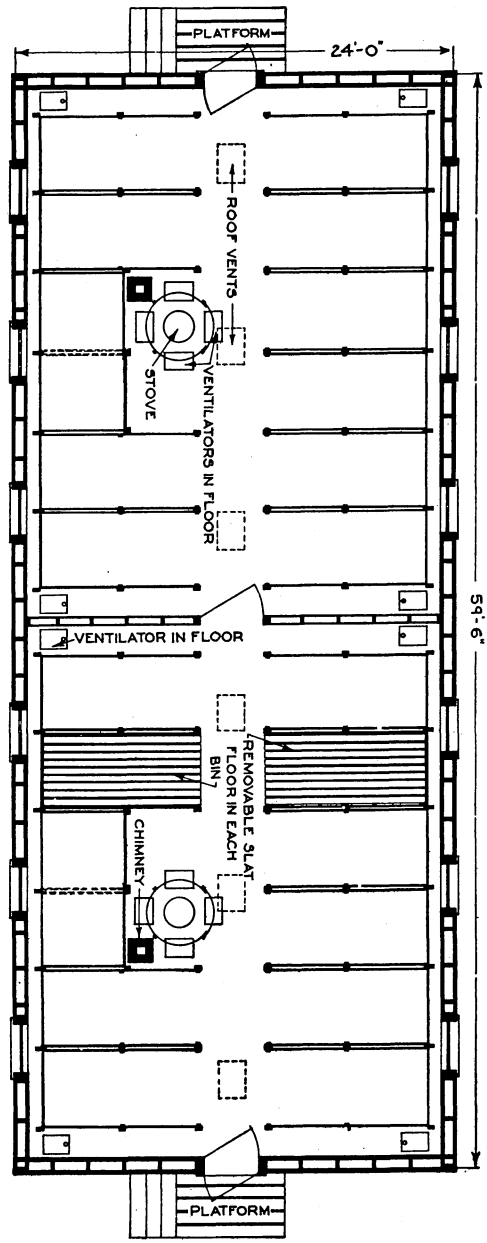

FIG. 6.—Floor plan of a sweet-potato storage house, size 24 by 59½ feet, having a capacity of 4,000 bushels in crates or 5,200 bushels in bulk

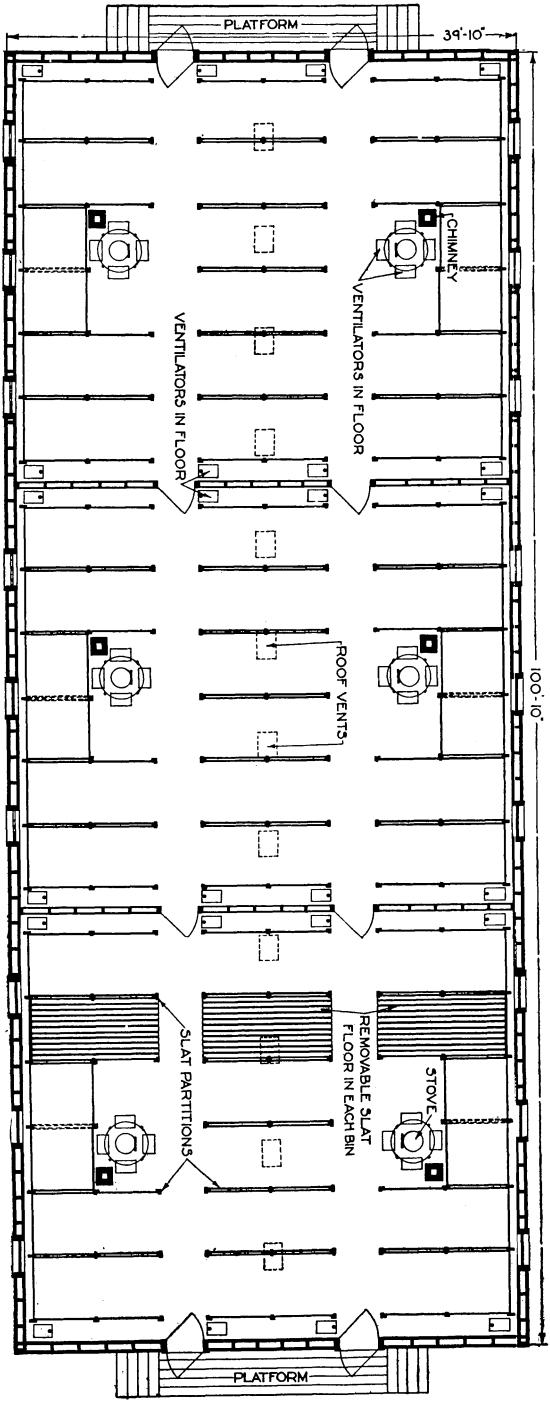

FIG. 7.—Floor plan of a sweet-potato storage house, size 39 feet 10 inches by 100 feet 10 inches, having a capacity of 12,000 bushels in crates or 15,000 bushels in bulk

use of two 10 by 12 inch floor ventilators near the stove, one 12 by 18 inch floor ventilator in each corner, and three 12 by 12 inch ceiling ventilators. The 16 by 29½ foot 1,000-bushel house is equipped with three 10 by 12 inch floor ventilators around the stove and six 12 by 18 inch floor ventilators, one in each corner and one along each side wall near the middle of the building. Two 18 by 20 inch roof ventilators are used in a house of this size. The size and location of the floor ventilators in the larger houses are shown in Figures 6 and 7. Complete details covering these plans and specifications may be had upon application to the Division of Rural Engineering, Bureau of Public Roads, United States Department of Agriculture.

The arrangement of the interior of the house depends upon the methods of storage used. Some growers store the potatoes in boxes, crates, baskets, or hampers, while others store in bins. The smaller containers are to be preferred to bins where it is practicable to use them, because they eliminate considerable handling and reduce the amount of decay. Many growers store in the hampers that are to be used

for marketing the potatoes. This is a satisfactory plan, as it requires no outlay of money for storage receptacles, and the packages for shipping must be provided in any event if the crop is to be marketed. Some growers have bushel boxes made for the special purpose of storing sweet potatoes, while others employ various types of used crates. With any type of package it is necessary to provide means for ventilation. A false slatted floor is often made by nailing 1 by 4 or 1 by 6 inch boards to 2 by 4 inch scantling. An inch space should be left between the boards to allow the air to circulate. A little space should be left between the stacks of boxes, baskets, crates, or hampers. Where these smaller containers are used, especially when the same package is employed for shipping the crop, it is much easier to disinfect the storage house by spraying than when bins are used. Another advantage in using them is that when decay sets in it usually spreads only to the potatoes in the single package, whereas in the bin it might spread throughout the entire pile.

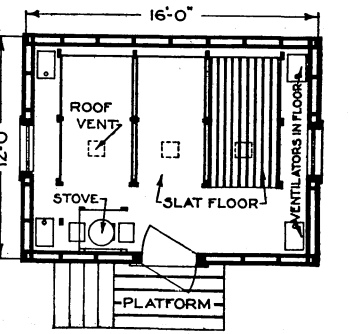

FIG. 8.—Floor plan of a sweet-potato storage house, size 12 by 16 feet, having a capacity of 400 to 500 bushels in crates or 450 to 500 bushels in bulk

If bins are to be used, the interior of the storage house should be arranged for convenience in handling the sweet potatoes. A passageway about 3½ to 4 feet in width is usually left between the rows of bins or between the wall and the bins in a house with only one row of bins. Sufficient open space must be left to allow access to the ventilators in the corners of the storage rooms. Satisfactory arrangements of passageways and bins for various-sized houses are shown in the floor plans of Figures 6 to 10.

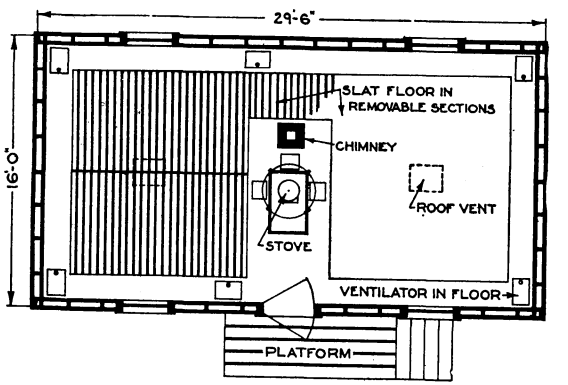

FIG. 9.—Floor plan of a sweet-potato storage house, size 16 by 29½ feet, having a capacity of about 1,000 bushels in crates, showing arrangement of floor ventilators, roof vents, chimney, and other structural details

The bins are made as follows:

For the corner and middle supports, 2 by 4 inch scantlings are set up, the lower end nailed to the floor and the upper end to the crosspieces used for tying the sides together. Over the supports 1 by 4 inch boards are nailed, leaving a 1-inch space between them. The ends of the bins parallel with the outside wall of the house must be built first, because there is not room enough to work between the bin and the outside wall. In making the slat floors, 2 by 4 inch scantlings are cut to go across the bin and placed on edge, one near each end and one or two equally spaced between. To these 1 by 4 or 1 by 6 inch boards are tacked, leaving a 1-inch space

between them. If left loose the slat floor racks can be taken out when the house is cleaned and disinfected during the summer. The size of the bins will depend somewhat on the arrangement and size of the house, but it is not advisable to make them more than 5 feet wide, 6 to 8 feet deep, and 10 to 12 feet long. There should be a 6 to 12 inch space between the walls and the bins to permit air to circulate. It is necessary to slat up both sides of the scantlings between the bins in order to leave an air space between the potatoes in the different bins. The construction here described allows a 4-inch space between the bins, a 4-inch space under the bins, and over 6 inches between the bins and outside walls.

MATERIALS REQUIRED FOR HOUSES OF DIFFERENT SIZES

It is not practicable to give the cost of a sweet-potato storage house, because of the differences in the price of materials and labor in the various sections of the country. However, given the quantities of materials required, it will be easy for one to obtain estimates on the cost of building a storage house. Quantities are given for the houses illustrated in the various figures.

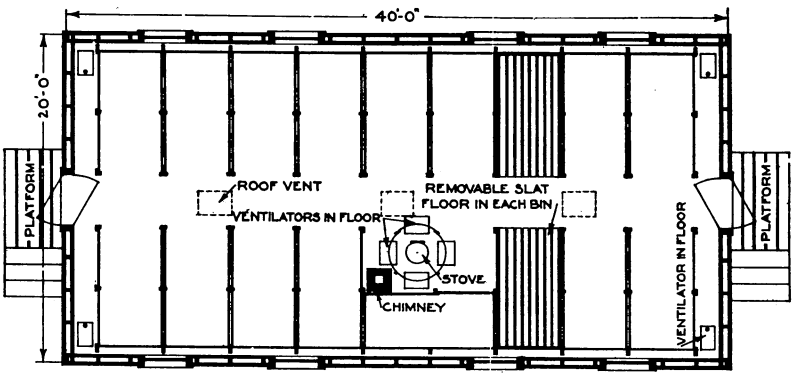

FIG. 10.—Floor plan of a sweet-potato storage house, size 20 by 40 feet, having a capacity of 2,000 bushels in crates or 2,500 bushels in bulk, showing location of ventilators, stove, arrangement of bins, and other details

Anyone who contemplates building a sweet-potato storage house after the plans shown in this bulletin can obtain working drawings by writing to the Division of Agricultural Engineering, Bureau of Public Roads, United States Department of Agriculture, Washington, D. C., for any of the plans for the five houses illustrated in Figures 1 to 11. In requesting plans, state which one of the five is desired.

MATERIALS REQUIRED FOR A SWEET-POTATO STORAGE HOUSE 12 BY 16 FEET, HAVING A CAPACITY OF 400 TO 500 BUSHELS IN CRATES OR 450 TO 500 BUSHELS IN BULK

Quantities are for dimensions shown on the drawing (8-foot studs) and must be altered if dimensions are changed. Footings should be carried below frost line or to solid ground.

If the potatoes are to be stored in bulk, the items marked with a star (*) are to be omitted. If storage is to be in crates, the stud walls should be 11 feet 6 inches high (instead of 7 feet 8 inches, as shown in the drawings), the items marked with a dagger (†) are to be omitted, and those marked with a star (*) are to be included.

Concrete.
Mixture—
One part Portland cement, three parts sand, and five parts gravel or broken stone; or, one part Portland cement and six parts bank-run gravel.
Quantities—
Cement, 6 sacks; sand, 20 cubic feet; gravel, 31 cubic feet; or, cement, 6 sacks; bank-run gravel 1½ cubic yards.

Chimney.
Mixture for mortar—
One part Portland cement, three parts sand.
Quantities—
Cement, 1 sack; sand, 4 cubic feet; bricks, 190; 1 terra-cotta thimble, 6-inch; 6 linear feet 8 by 8 inch terra-cotta flue lining.

Lumber.
Girders—
Two 6 by 10 inches by 12 feet.
Three 6 by 10 inches by 16 feet.
Joists—
Seventeen 2 by 8 inches by 12 feet.
Studs—
†Nineteen 2 by 4 inches by 16 feet.
*Thirty-eight 2 by 4 inches by 12 feet.
Plates—
Six 2 by 4 inches by 16 feet.
Six 2 by 4 inches by 12 feet.
Ties—
Four 2 by 4 inches by 12 feet.
Rafters—
Eleven 2 by 4 inches by 16 feet.
One 1 by 6 inches by 18 feet (ridge).
Sheathing (includes 20 per cent waste)—
2,084 feet board measure 1 by 6 inches.
*530 feet board measure 1 by 6 inches.
Drop siding (includes 20 per cent waste)—
615 feet board measure 1 by 6 inches.
*265 feet board measure 1 by 6 inches.
Flooring (tongue and groove, includes 25 per cent waste)—
1,000 feet board measure 1 by 4 inches.
*280 feet board neasure 1 by 4 inches.
**Slat floor—*
Four 2 by 4 inches by 16 feet.
Thirty-five 1 by 4 inches by 14 feet.
Platform—
Three 2 by 4 inches by 12 feet.
One 2 by 8 inches by 14 feet.
Three 2 by 8 inches by 12 feet.
One 4 by 4 inches by 6 feet.
One 2 by 12 inches by 12 feet.
Two 1 by 10 inches by 14 feet.
Trim (surfaced 4 sides)—
†Five 1⅛ by 4½ inches by 18 feet.
One 1⅛ by 4½ inches by 14 feet.
*Ten 1⅛ by 4½ inches by 12 feet.
Two 1 by 6 inches by 16 feet.
Two 1 by 8 inches by 16 feet.
Two 1 by 8 inches by 12 feet.
Two 1 by 6 inches by 18 feet.
Seventy linear feet 1⅛ by 2½ inches (drip molding).

Lumber—Continued.
Ventilators in roof (surfaced 4 sides)—
Three 1 by 12 inches by 14 feet.
†*Bins—*
Six 2 by 4 inches by 16 feet.
Three 2 by 4 inches by 12 feet.
Two 2 by 2 inches by 16 feet.
Six 1 by 2 inches by 16 feet.
Thirty-four 1 by 4 inches by 12 feet.
Sixty-five 1 by 4 inches by 14 feet.
Chimney platform—
†One 2 by 6 inches by 12 feet.
*Two 2 by 6 inches by 10 feet.

Roof covering.
As desired, for 290 square feet.

Building paper.
20 squares; *2 squares.

Miscellaneous.
Two single sash and frames for 6 lights, 9 by 12 inch glass, 4-inch studs.
One No. 2 glazed door, 3 by 7 feet, 6 lights, 8 by 10 inch glass.
One frame for glazed door, 3 by 7 feet, 4-inch studs.
Three pairs 2 by 2 inch galvanized hinges.
Two pairs 2½ by 2½ inch galvanized hinges (windows).
One pair 3½ by 3½ inch loose-pin butts (glazed doors).
One pair 6-inch galvanized T hinges (battened doors).
Four pairs 4-inch galvanized T hinges (shutters).
Two pairs chain bolts, chains, and keepers (windows).
Three pairs ⅞ by 2¼ inch sash centers (ventilators).
Four pairs ⅜ by 3 inch bolts, with 4-inch ring (floor ventilators).
Nine pairs ⅝ by 18 inch bolts, nuts, and washers (foundation).
Two wrought-steel straps ¼ by 2½ by 18 inches (platform posts).
Four lag screws ¼ by 3 inches (platform posts).
Thirty-six linear feet ¼-inch rope.
Four linear feet galvanized flashing 12 inches wide (around chimney).
Twelve linear feet galvanized flashing 8 inches wide (roof ventilators).
Fourteen square feet ¼-inch mesh wire cloth (vents).
Four window-spring bolts.
Two chains 8 inches long, with screw eyes and hooks (windows).
One sheet-iron pad and heat screen, as detailed.
Latches for doors and shutters, as desired.

Nails.
Four pounds 20-penny, 17 pounds 10-penny, 85 pounds 8-penny, 10 pounds 6-penny, 3 pounds 8-penny finishing.

Paint.
Three outside coats, 4 gallons.

MATERIALS REQUIRED FOR A SWEET-POTATO STORAGE HOUSE 16 BY 29½ FEET, HAVING A CAPACITY OF ABOUT 1,000 BUSHELS IN CRATES

Quantities are for dimensions shown on the drawings. Footings should bear on solid ground. If piers are built to a greater height, they should be increased in cross-sectional area.

Concrete.
Mixture—
One part Portland cement, three parts sand, and five parts gravel or broken stone.
Quantities—
Cement, 12 sacks; sand, 1¼ cubic yards; gravel, 1½ cubic yards.

Chimney.
Quantities—
Cement, 3 sacks; sand, ½ cubic yard; bricks, 730; 1 terra-cotta thimble, 5-inch; 12 linear feet 8 by 8 inch terra-cotta flue lining; 4 linear feet galvanized flashing 18 inches wide.

Lumber.
Girders—
Six 8 by 10 inches by 16 feet.
Two 4 by 10 inches by 16 feet.

Lumber—Continued.
Joists—
Twenty-six 2 by 8 inches by 16 feet.
150 linear feet 1 by 3 inches (bridging).
Studs—
Sixty-four 2 by 4 inches by 12 feet.
Horizontals—
Eleven 2 by 4 inches by 10 feet.
Braces—
Eight 2 by 4 inches by 12 feet.
Plates—
Twelve 2 by 4 inches by 16 feet.
Ties—
Two 2 by 6 inches by 16 feet.
Rafters—
Thirty-two 2 by 6 inches by 10 feet.
Two 1 by 8 inches by 16 feet (ridge).

Lumber—Continued.
Collar beams—
Nine 2 by 6 inches by 8 feet.
Platform—
One 2 by 4 inches by 10 feet (posts).
Twelve 2 by 4 inches by 10 feet.
One 2 by 8 inches by 14 feet.
Five 2 by 8 inches by 10 feet.
One 2 by 10 inches by 10 feet (steps).
One 2 by 10 inches by 16 feet (steps).
Trim (surfaced 4 sides)—
Four 2 by 6 inches by 10 feet (rafters).
Six 1 by 8 inches by 16 feet (base).
Eight 1 by 4½ inches by 12 feet (corner boards).
Four 1 by 6 inches by 16 feet (saddle boards).
Eight 1 by 4½ inches by 8 feet (windows and doors).
111 linear feet 1⅛ by 2½ inches (drip molding).
Ventilators—
Four 1 by 10 inches by 12 feet.
Two 1 by 6 inches by 10 feet (roofing boards).
Four 1 by 3 inches by 16 feet.
4 pieces wire cloth ¼-inch mesh, 20 by 15 inches.
12 linear feet galvanized flashing 18 inches wide.
2 pairs 2¼ by ⅞ inch sash centers.
2 screw eyes.
Sheathing (includes 20 per cent waste)—
5,500 feet board measure 1 by 6 inches.
Flooring (tongue and groove, includes 25 per cent waste)—
2,500 feet board measure 1 by 4 inches.
Drop siding (includes 20 per cent waste)—
1,500 feet board measure 1 by 6 inches.

Lumber—Continued.
Slat floor—
If slats over whole floor are desired, use these items: Seventeen 2 by 4 inches by 12 feet; sixty 1 by 4 inches by 12 feet.
If slats under edges of boxes are desired, use these items: 120 linear feet 2 by 4 inches; 18 pieces 1 by 4 inches by 12 feet.
Roof covering.
As desired, for 682 square feet.
Building paper.
4,600 square feet.
Miscellaneous.
16 pairs 2-inch galvanized butts.
1 pair butts (door).
1 pair 6-inch galvanized T hinges.
1 lock and latch (door).
Fasteners for shutters and windows.
Galvanized iron (floor under stove).
15 anchor bolts ⅝ by 18 inches.
3 straps ¾ by ¼ by 12 inches.
6 lag screws ¼ by 3 inches.
Four 6-light sash, 9 by 12 inch glass, with frames and sills.
1 glazed door 3 by 7 feet, 6 lights 8 by 12 inch glass, with frame and sills.
12 linear feet galvanized wire cloth, ½-inch mesh, 18 inches wide.
Nails.
35 pounds 6-penny, 6 pounds 6-penny finishing, 200 pounds 8-penny, 40 pounds 10-penny, 5 pounds 20-penny.
Paint.
6 gallons.

MATERIALS REQUIRED FOR A SWEET-POTATO STORAGE HOUSE 20 BY 40 FEET, HAVING A CAPACITY OF 2,000 BUSHELS IN CRATES OR 2,500 BUSHELS IN BULK

This building is designed for the storage of potatoes in crates or in one tier of bins in which the potatoes may be loaded 6 feet high.

Quantities are for dimensions shown on the drawings (9-foot 4-inch studs) and should be altered if dimensions are changed. Footings should be carried below frost line or to solid ground.

If the potatoes are to be stored in bulk, the items marked with a star (*) are to be omitted. If storage is to be in crates, the stud walls should be 12 feet 4 inches high (instead of 9 feet 4 inches, as shown in the drawings), the items marked with a dagger (†) are to be omitted, and those marked with a star (*) are to be included.

Concrete.
Mixture—
One part Portland cement, three parts sand, and five parts gravel or broken stone; or, one part Portland cement and six parts bank-run gravel.
Quantities—

Constituents	Walls	Piers
Cement	79 sacks	7 sacks.
Sand	8.7 cu. yds	21 cu. ft.
Gravel	14.5 cu. yds	34 cu. ft.
Or—		
Cement	79 sacks	7 sacks.
Bank-run gravel	19 cu. yds	1.8 cu. yds.

Chimney.
Mixture for mortar—
One part Portland cement, three parts sand.
Quantities—
Cement, 3 sacks, *1 sack: Sand 10 cubic feet, *1½ cubic feet; bricks 700, *bricks 90; 1 terra-cotta thimble, 6-inch; 12 linear feet 8 by 8 inch terra-cotta flue lining, *4 linear feet.
Lumber.
Girders—
Two 8 by 12 inches by 16 feet.
One 8 by 12 inches by 8 feet.
Sills—
Twenty-four 2 by 8 inches by 12 feet.
Studs—
†Twenty-six 2 by 4 inches by 18 feet (side).
*Fifty-four 2 by 4 inches by 12 feet (side).
*Four 2 by 4 inches by 10 feet (window).
*Twenty-four 2 by 4 inches by 12 feet (end).
†Four 2 by 4 inches by 12 feet (over windows).

Lumber—Continued.
Studs—Continued.
†Twelve 2 by 4 inches by 18 feet (end).
One 2 by 4 inches by 16 feet (end).
Two 2 by 4 inches by 12 feet (end).
Four 2 by 4 inches by 10 feet (end).
One 2 by 4 inches by 14 feet (over doors).
Plates—
†Twenty-four 2 by 4 inches by 10 feet (side).
†Twelve 2 by 4 inches by 10 feet (end).
*Sixteen 2 by 4 inches by 10 feet (side).
*Eight 2 by 4 inches by 10 feet (end).
*Eight 2 by 4 inches by 10 feet (stops).
*Eight 2 by 4 inches by 10 feet (on top of ties).
Rafters—
Forty-four 2 by 6 inches by 14 feet.
Two 2 by 6 inches by 12 feet.
Two 1 by 6 inches by 12 feet (ridge).
Two 1 by 6 inches by 10 feet (ridge).
Six 2 by 4 inches by 14 feet (collar beams).
Joists—
Eighty-four 2 by 10 inches by 10 feet.
160 linear feet 1 by 3 inches (bridging).
*Eight 2 by 4 inches by 10 feet (bridging).
*Twelve 2 by 6 inches by 12 feet (ties and braces).
Sheathing (includes 20 per cent waste)—
2,568 feet board measure 1 by 6 inches (roof).
*830 feet board measure 1 by 6 inches.
1,032 feet board measure 1 by 6 inches (ceiling).
1,200 feet board measure 1 by 6 inches (inside walls).
1,344 feet board measure 1 by 6 inches (outside walls).
960 feet board measure 1 by 6 inches (subfloor).
1,344 feet board measure 1 by 6 inches (drop siding).
*420 feet board measure 1 by 6 inches (drop siding).

Lumber—Continued.
Flooring (tongue and groove, includes 25 per cent waste)—
1,075 feet board measure 1 by 4 inches (ceiling).
1,400 feet board measure 1 by 4 inches (walls).
*440 feet board measure 1 by 4 inches (walls).
1,000 feet board measure 1 by 4 inches (floor).
Ventilators in roof (surfaced 4 sides)—
Three 1 by 10 inches by 16 feet.
Three 1 by 12 inches by 10 feet.
170 linear feet 1 by 3 inches.
24 linear feet 1 by 4 inches.
One 1 by 10 inches by 12 feet (roof boards).
One 1 by 10 inches by 8 feet (roof boards).
One 1 by 8 inches by 12 feet (roof boards).
One 1 by 8 inches by 8 feet (roof boards).
Trim (surfaced 4 sides)—
Three 1⅛ by 4½ inches by 14 feet (doors).
Eight 1⅛ by 4½ inches by 10 feet (windows).
†Four 1⅛ by 4½ inches by 18 feet (corners).
*Eight 1⅛ by 4½ inches by 10 feet.
Four 1⅛ by 4½ inches by 14 feet (end fascia).
Twelve 1 by 8 inches by 10 feet (baseboard).
Four 1 by 6 inches by 12 feet (ridge).
Four 1 by 6 inches by 10 feet (ridge).
150 linear feet 1⅛ by 2½ inches (drip molding).
Bins—
†Twenty-nine 2 by 4 inches by 18 feet (studs).
†Ten 2 by 2 inches by 18 feet (nailing strips).
†Twenty 1 by 6 inches by 12 feet (ties at partitions).
†Twenty 1 by 6 inches by 16 feet (ties at partitions).
†Thirty-two 1 by 2 inches by 18 feet (cleats for loose boards).
†Eight 2 by 6 inches by 10 feet (over bins).
Eighteen 2 by 4 inches by 12 feet (under removable floors).
†Four hundred 1 by 4 inches by 16 feet (side).
Seventy-two 1 by 4 inches by 16 feet (removable floors).
†One hundred and sixty-two 1 by 4 inches by 16 feet (loose slats).
Eight 1 by 6 inches by 10 feet (battens for shutters and doors).
Screens (surfaced 4 sides, for foundation windows)—
Three ¾ by 2 inches by 16 feet.
Platforms—
Five 2 by 8 inches by 12 feet (sides and floor).
One 2 by 8 inches by 14 feet (side).
Two 2 by 12 inches by 12 feet (carriages).

Lumber—Continued.
Platforms—Continued.
Two 4 by 4 inches by 12 feet (posts).
Two 2 by 4 inches by 12 feet (nailing strips).
Three 2 by 4 inches by 14 feet (joists).
Two 2 by 10 inches by 14 feet (treads).
Roof covering.
As desired, for 1,700 square feet.
Building paper.
58 squares; *4 squares.
Miscellaneous.
6 cellar sash and frames for 3 lights, 8 by 10 inch glass.
8 single sash and frames for 6 lights, 9 by 12 inch glass (4-inch studs).
2 No. 2 glazed doors 3 by 7 feet, 6 lights, 8 by 10 inch glass.
2 frames for glazed doors 3 by 7 feet (4-inch studs).
22 pairs 2½ by 2½ inch galvanized hinges (stove-floor vents and sash).
2 pairs 3½ by 3½ inch loose-pin butts (glazed doors).
2 pairs 6-inch galvanized T hinges (battened doors).
16 pairs 4-inch galvanized T hinges (shutters).
3 pairs ⅞ by 2¼ inch sash centers (ventilators).
3 screw eyes in ventilator.
36 linear feet ¼-inch rope.
4 bolts, ⅝ by 3 inches, with 4-inch rings (floor ventilators).
45 square feet ¼-inch mesh galvanized wire cloth (vents and foundation screens).
24 bolts, nuts, and washers ⅝ by 18 inches (foundations).
6 linear feet galvanized-iron flashing 12 inches wide (around chimney).
30 linear feet galvanized-iron flashing 8 inches wide (roof ventilators).
4 wrought-steel straps ¼ by 2½ inches (platform posts).
8 lag screws ¼ by 3 inches (platform posts).
1 sheet-metal pad and heat shield, as detailed.
8 adjusting rods and fittings for windows, as detailed.
Latches for doors, shutters, and foundation windows, as selected.
Nails.
2 pounds 30-penny, 10 pounds 20-penny, 30 pounds 10-penny, 300 pounds 8-penny, 100 pounds 6-penny, 10 pounds 8-penny finishing.
Paint.
Three outside coats, 8 gallons.

MATERIALS REQUIRED FOR A SWEET-POTATO STORAGE HOUSE 24 BY 59½ FEET, HAVING A CAPACITY OF ABOUT 4,000 BUSHELS IN CRATES OR 5,200 BUSHELS IN BULK

This building is designed for the storage of potatoes in crates or in one tier of bins in which the potatoes may be loaded 6 feet high.

Quantities are for dimensions shown on the drawings (9-foot 4-inch studs) and should be altered if dimensions are changed. Footings should be carried below frost line or to solid ground.

If the potatoes are to be stored in bulk, the items marked with a star (*) are to be omitted. If storage is to be in crates, the stud walls should be 12 feet 4 inches high (instead of 9 feet 4 inches, as shown in the drawings), the items marked with a dagger (†) are to be omitted, and those marked with a star (*) are to be included.

Concrete.
Mixture—
One part Portland cement, three parts sand, and five parts gravel or broken stone; or, one part Portland cement and six parts bank-run gravel.
Quantities—

Constituents	Walls	Piers
Cement	109 sacks	15 sacks.
Sand	12 cu. yds	1.5 cu. yds.
Gravel	20 cu. yds	2.6 cu. yds.
Or—		
Cement	109 sacks	15 sacks.
Bank-run gravel	24 cu. yds	3.3 cu. yds.

Chimneys.
Mixture for mortar—
One part Portland cement, three parts sand.
Quantities—
Cement 10 sacks, *1 sack; sand 1⅓ cubic yards, *1¼ cubic feet; bricks 1,560, *bricks 180; 2 terra-cotta thimbles, 6-inch; 28 linear feet 8 by 8 inch terra-cotta flue lining, *6 linear feet.
Lumber.
Girders—
Four 8 by 10 inches by 18 feet.
Three 8 by 10 inches by 16 feet.
Sills—
Twenty-eight 2 by 8 inches by 12 feet.
Studs—
Sixty-two 2 by 6 inches by 18 feet.
*Ninety 2 by 6 inches by 12 feet.
*Twelve 2 by 6 inches by 14 feet (gable).

Lumber—Continued.
Studs—Continued.
*Twelve 2 by 6 inches by 10 feet (window).
†Four 2 by 6 inches by 14 feet.
Plates—
*Fourteen 2 by 6 inches by 12 feet (bridging).
Fourteen 2 by 6 inches by 10 feet (stops).
Seven 2 by 6 inches by 12 feet (over doors and windows).
Twenty-eight 2 by 6 inches by 12 feet.
**Ties*—
Twelve 2 by 6 inches by 12 feet.
Nine 2 by 6 inches by 14 feet.
Rafters—
Sixty-two 2 by 6 inches by 16 feet.
Three 2 by 6 inches by 12 feet.
Six 1 by 6 inches by 12 feet (ridge).
Collar beams—
Eight 2 by 4 inches by 14 feet.
Joists—
Forty-eight 2 by 10 inches by 16 feet.
Twenty-four 2 by 10 inches by 18 feet.
400 linear feet 1 by 3 inches (bridging).
Sheathing (includes 20 per cent waste)—
11,220 feet board measure 1 by 6 inches.
*1,400 feet board measure 1 by 6 inches.
Flooring (tongue and groove, includes 25 per cent waste)—
6,500 feet board measure 1 by 4 inches.
*780 feet board measure 1 by 4 inches.
**Slat floor*—
One hundred 1 by 4 inches by 18 feet.
Twenty-two 2 by 4 inches by 16 feet.
Drop siding (includes 20 per cent waste)—
2,000 feet board measure 1 by 6 inches.
*600 feet board measure 1 by 6 inches.
Trim (surfaced 4 sides)—
Twelve ⅛ by 4½ inches by 10 feet.
*Eight ⅛ by 4½ inches by 10 feet.
†Four ⅛ by 4½ inches by 18 feet.
Four 1 by 6 inches by 16 feet.
Fourteen 1 by 8 inches by 12 feet.
160 linear feet 1⅛ by 2½ inches (drip molding).
Ventilators in roof (surfaced 4 sides)—
Six 1 by 10 inches by 16 feet.
Six 1 by 12 inches by 10 feet.
340 linear feet 1 by 3 inches.
48 linear feet 1 by 4 inches.
Three 1 by 10 inches by 12 feet (roof boards).
Three 1 by 8 inches by 12 feet (roof boards).
†*Bins*—
Five hundred and seventy-five 1 by 4 inches by 18 feet.
Ninety-five 1 by 4 inches by 16 feet.
Forty 2 by 4 inches by 18 feet.
Fourteen 2 by 2 inches by 18 feet.
Sixty-six 1 by 6 inches by 12 feet.
Forty 1 by 2 inches by 16 feet.
Eight 2 by 6 inches by 10 feet.
Two 2 by 6 inches by 18 feet.

Lumber—Continued.
Dividing partitions—
†Ten 2 by 4 inches by 18 feet.
*Thirteen 2 by 4 inches by 12 feet.
*Six 2 by 4 inches by 14 feet.
†Five 2 by 4 inches by 12 feet (plates and bridging).
Two 2 by 4 inches by 14 feet (at ceiling).
Screens (for foundation windows)—
Six ¾ by 2 inches by 16 feet (surfaced 4 sides).
Platforms—
Six 2 by 4 inches by 12 feet.
Two 2 by 8 inches by 14 feet.
Six 2 by 8 inches by 12 feet.
One 4 by 4 inches by 12 feet.
Two 2 by 12 inches by 12 feet.
Four 2 by 10 inches by 14 feet.

Roof covering.
As desired, for 1,860 square feet.

Building paper.
103 squares; *11 squares.

Miscellaneous.
12 foundation sash and frames for 3 lights, 8 by 10 inch glass.
12 single sash and frames for 6 lights, 9 by 12 inch glass (6-inch studs).
2 No. 2 glazed doors, 3 by 7 feet; 6 lights, 8 by 10 inch glass.
2 frames for glazed doors 3 by 7 feet (6-inch studs).
32 pairs 2½ by 2½ inch galvanized hinges.
2 pairs 3½ by 3½ inch galvanized loose-pin butts.
3 pairs 6-inch T hinges (battened doors).
4 pairs 4-inch T hinges (shutters).
6 pairs ⅞ by 2¼ inch sash centers.
8 bolts ⅝ by 3 inches, with 4-inch rings (floor ventilators).
50 linear feet galvanized flashing 8 inches wide (roof ventilators).
16 linear feet galvanized flashing 12 inches wide (around chimneys).
40 bolts, nuts, and washers, ⅝ by 18 inches.
4 wrought-steel straps ¼ by 2½ by 18 inches (platform posts).
16 lag screws ¼ by 3 inches (platform posts).
6 screw eyes (in ventilator).
72 linear feet ¼-inch rope.
90 square feet ¼-inch mesh wire cloth (vents and foundation screens).
12 adjusting rods and fittings for windows, as detailed.
2 sheet-iron pads and heat shields, as detailed.
Latches for doors, shutters, and foundation windows, as desired.

Nails.
10 pounds 20-penny, 180 pounds 10-penny, 400 pounds 8-penny, 50 pounds 6-penny, 15 pounds 8-penny finishing.

Paint.
Three outside coats, 10 gallons.

MATERIALS REQUIRED FOR A SWEET-POTATO STORAGE HOUSE 39 FEET 10 INCHES BY 100 FEET 10 INCHES, HAVING A CAPACITY OF ABOUT 12,000 BUSHELS IN CRATES OR 15,000 BUSHELS IN BULK

This building is designed for the storage of potatoes in crates or in one tier of bins in which the potatoes may be loaded 6 feet high.

Quantities are for dimensions shown on the drawings (8-foot studs) and should be altered if dimensions are changed. Footings should be carried below frost line or to solid ground.

If the potatoes are to be stored in bulk, the items marked with a star (*) are to be omitted. If storage is to be in crates, the stud walls should be 11 feet 4 inches high (instead of 7 feet 10 inches, as shown in the drawings), the items marked with a dagger (†) are to be omitted, and those marked with a star (*) are to be included.

Concrete.

Mixture—

One part Portland cement, three parts sand, and five parts gravel or broken stone; or, one part Portland cement and six parts bank-run gravel.

Quantities—

Constituents	Walls	Piers
Cement	185 sacks	34 sacks.
Sand	21 cu. yds	4 cu. yds.
Gravel	34.5 cu. yds	6.5 cu. yds.
Or—		
Cement	185 sacks	34 sacks.
Bank-run gravel	44 cu. yds	8 cu. yds.

Chimneys.

Mixture for mortar—

One part Portland cement, three parts sand.

Quantities—

Cement 30 sacks, *4 sacks; sand 3½ cubic yards, *0.3 cubic yard; bricks 5,000, *bricks 600; 6 terra-cotta thimbles, 6-inch; 96 linear feet 8 by 8 inch terra-cotta flue lining, *22 linear feet.

Lumber.

Girders—
Six 10 by 12 inches by 10 feet.
Fourteen 10 by 12 inches by 16 feet.
One 10 by 12 inches by 14 feet.

Sills—
Thirty-five 2 by 8 inches by 16 feet.

Studs—
†Sixty-two 2 by 6 inches by 18 feet (side).
*One hundred and twenty-four 2 by 6 inches by 12 feet (side).
Nine 2 by 6 inches by 12 feet (over windows).
†Twenty-two 2 by 6 inches by 18 feet (end).
Twenty 2 by 6 inches by 10 feet (end).
*Forty-four 2 by 6 inches by 12 feet (end).
*Eight 2 by 4 inches by 10 feet.
Two 2 by 6 inches by 14 feet (over doors).

Plates—
Fifty-two 2 by 6 inches by 12 feet (side).
Sixteen 2 by 6 inches by 10 feet (end).

Purlin posts—
†Thirty-six 2 by 4 inches by 16 feet.
†Twenty-four 2 by 4 inches by 14 feet.
*Forty-two 2 by 6 inches by 12 feet.
*Six 2 by 6 inches by 16 feet.

Ties—
Twenty-four 2 by 6 inches by 10 feet.
Twenty-four 2 by 6 inches by 12 feet.
Six 2 by 6 inches by 18 feet (upper).
Twelve 1 by 6 inches by 10 feet (hangers).

Purlins—
Twelve 2 by 6 inches by 12 feet.
†Twelve 2 by 6 inches by 12 feet.
†Six 2 by 6 inches by 10 feet.
Six 2 by 6 inches by 10 feet.
*Six 2 by 8 inches by 10 feet.
*Twelve 2 by 8 inches by 12 feet.

Purlin braces—
Twelve 2 by 6 inches by 14 feet.
*Six 2 by 6 inches by 14 feet.

Rafters—
One hundred and thirty 2 by 6 inches by 12 feet.
One hundred and thirty 2 by 6 inches by 14 feet.
Twelve 1 by 6 inches by 10 feet (ridge).

Collar beams—
Sixteen 2 by 4 inches by 14 feet.
Four 2 by 6 inches by 12 feet.

Joists—
Two hundred and two 2 by 10 inches by 12 feet.
One hundred and one 2 by 10 inches by 18 feet.
800 linear feet 1 by 3 inches (bridging).

Sheathing (includes 20 per cent waste)—
11,870 feet board measure 1 by 6 inches (roof).
5,280 feet board measure 1 by 6 inches (ceiling).
2,920 feet board measure 1 by 6 inches (inside walls).
3,450 feet board measure 1 by 6 inches (outside walls).

Lumber—Continued.

Sheathing—Continued.
4,800 feet board measure 1 by 6 inches (subfloor).
*2,340 feet board measure 1 by 6 inches.

Drop siding (includes 20 per cent waste)—
3,400 feet board measure 1 by 6 inches.
*1,180 feet board measure 1 by 6 inches.

Flooring (tongue and groove, includes 25 per cent waste)—
5,500 feet board measure 1 by 4 inches (ceiling).
3,440 feet board measure 1 by 4 inches (walls).
5,000 feet board measure 1 by 4 inches (floor).
*1,200 feet board measure 1 by 4 inches.

Trim (surfaced 4 sides)—
Six 1⅛ by 4½ inches by 14 feet (doors).
†Five 1⅛ by 4½ inches by 18 feet (corners).
*Eight 1⅛ by 4½ inches by 12 feet.
Eight 1⅛ by 4½ inches by 12 feet (end fascia).
Twelve 1⅛ by 4½ inches by 10 feet (windows).
Twenty-four 1 by 8 inches by 12 feet (baseboards).
Eighteen 1 by 6 inches by 12 feet (roof ridge).
350 linear feet 1⅛ by 2½ inches (drip molding)

Ventilators in roof (surfaced 4 sides)—
Twelve 1 by 10 inches by 16 feet.
Twelve 1 by 12 inches by 10 feet.
680 linear feet, 1 by 3 inches.
100 linear feet, 1 by 4 inches.
Six 1 by 10 inches by 12 feet (roof boards).
Six 1 by 8 inches by 12 feet (roof boards).

Dividing partitions—
Eight 2 by 4 inches by 10 feet (plates).
*Eight 2 by 4 inches by 10 feet.
Eight 2 by 4 inches by 18 feet (studs).
Eight 2 by 4 inches by 16 feet (studs).
*Four 2 by 4 inches by 16 feet.
Eight 2 by 4 inches by 14 feet (studs).
†Four 2 by 4 inches by 14 feet (studs).
Eight 2 by 4 inches by 12 feet (studs).
Eight 2 by 4 inches by 10 feet (studs).
†Two 2 by 4 inches by 12 feet (over doors).
*Two 2 by 4 inches by 14 feet (over doors).
2,655 feet board measure 1 by 4 inch tongue-and-groove flooring (includes 25 per cent waste).
*690 feet board measure 1 by 4 inch tongue-and-groove flooring (includes 25 per cent waste).

Screens (foundation windows)—
Nine ¾ by 2 inches by 16 feet (surfaced 4 sides).

Bins—
†Seventy-two 2 by 4 inches by 18 feet (studs).
†Twenty-one 2 by 2 inches by 18 (nailing strips).
†Twenty-one 1 by 6 inches by 18 feet.[1]
†Forty-two 1 by 6 inches by 12 feet.[1]
†Twenty-one 1 by 6 inches by 16 feet.[1]
†Forty-two 1 by 6 inches by 10 feet.[1]
†One hundred and eighteen 1 by 2 inches by 18 feet (cleats for loose boards).
†Forty-two 2 by 6 inches by 12 feet (over bins).
†Twenty-one 2 by 6 inches by 10 feet (over bins).
Seventy-seven 2 by 4 inches by 12 feet (removable floors).
†One thousand nine hundred and thirty-eight 1 by 4 inches by 10 feet (bin sides).
†One hundred and fourteen 1 by 4 inches by 12 feet (bin sides).
Four hundred and sixty-two 1 by 4 inches by 10 feet (removable floors).
Sixty-six 1 by 4 inches by 12 feet (removable floors).
†One thousand and eighty-three 1 by 4 inches by 10 feet (loose slats).

Battens (shutters and doors)—
Twenty-two 1 by 6 inches by 10 feet.

Platforms—
Eight 2 by 4 inches by 10 feet (nailing strips).
Three 2 by 12 inches by 14 feet (carriages).
Four 4 by 4 inches by 12 feet (posts).
One 2 by 8 inches by 14 feet (sides and flooring).
Twenty-eight 2 by 8 inches by 10 feet (sides and flooring).
Ten 2 by 4 inches by 14 feet (joists).
Three 2 by 10 inches by 14 feet (treads).

Roof covering.

As desired, for 4,950 square feet.

Building paper.

230 squares; *22 squares.

[1] **Ties at partitions.** Stagger joints, using 12's with 18's and 16's with 10's.

Miscellaneous.
18 cellar sash and frames for 3 lights, 8 by 10 inch glass.
18 single sash and frames for 6 lights, 9 by 12 inch glass (6-inch studs).
4 No. 2 glazed doors, 3 by 7 feet, and frames for 6-inch studs.
4 frames for inside doors, 3 by 7 feet, 4-inch studs.
60 pairs 2½ by 2½ inch galvanized hinges (stove-floor vents and windows).
8 pairs 6-inch galvanized T hinges (battened doors).
36 pairs 4-inch galvanized T hinges (shutters).
12 pairs ⅞ by 2¼ inch sash centers.
4 pairs 3½ by 3½ inch loose-pin butts (glazed doors).
12 screw eyes (ventilator).
144 linear feet ¼-inch rope.
24 bolts ⅜ by 3 inches with 4-inch rings (floor ventilators).
130 square feet ¼-inch mesh galvanized wire cloth (vents and foundation screens).

Miscellaneous—Continued.
50 bolts, nuts, and washers, ⅝ by 18 inches foundation).
40 linear feet galvanized flashing 12 inches wide (around chimneys).
100 linear feet galvanized flashing 8 inches wide (roof ventilators).
8 wrought-steel straps ¼ by 2½ by 18 inches (platform posts).
16 lag screws ¼ by 3 inches (platform posts).
18 adjusting rods and fittings for windows, as detailed.
6 sheet-iron pads and heat screens, as detailed.
Latches for doors, shutters, and foundation windows, as desired.

Nails.
12 pounds 30-penny, 25 pounds 20-penny, 77 pounds, 10-penny, 930 pounds 8-penny, 190 pounds 6-penny, 30 pounds 8-penny finishing.

Paint.
Three outside coats, 20 gallons.

UTILIZING ABANDONED TENANT HOUSES, WAREHOUSES, AND OTHER STRUCTURES FOR STORING SWEET POTATOES

On many farms in the South there are abandoned tenant houses and various other buildings that can be converted into sweet-potato storage houses at very little expense. In many towns there are warehouses, store buildings, and other structures that can be utilized to advantage for storing sweet potatoes. Where such structures are available on the farms or in towns they should be utilized before erecting new houses. The same methods of insulating and ventilating should be used in remodeling old structures as are recommended for new sweet-potato storage houses. Where the interior of the house to be remodeled is not already sheathed it is advisable to nail a layer of 1 by 4 or 1 by 6 inch boards on the studding, then a layer of building paper, and over this matched boards, as shown in Figure 11. The tighter the house is made, the less attention is required to keep the temperature and moisture under proper control.

Where only a few bushels of sweet potatoes are to be stored they may be kept in a loft over the kitchen or in any place in the house where the temperature is quite uniform (between 50° and 60° F.) and the air rather dry.

VARIETIES OF SWEET POTATOES FOR MARKET

The varieties of sweet potatoes to grow depend upon the market to be supplied. The northern and eastern markets prefer a dry, mealy potato, such as the Big-Stem Jersey, Yellow Jersey, and Gold Skin, although such varieties as the Nancy Hall, Dooley, and Triumph have been sold to good advantage in all the northern markets. The main reason that southern-grown sweet potatoes have not been in greater demand on the northern markets is because they have been poorly graded and packed. The markets of the South prefer the moist varieties, such as Porto Rico, Nancy Hall, Dooley, and Pumpkin "yam." The Triumph, a light-colored, moderately dry fleshed sweet potato, is grown to some extent for shipping to northern markets early in the season.

The southern farmers should supply their own markets, before trying to ship potatoes to northern markets. During late winter and early spring many large towns and cities of the South are poorly supplied, because of lack of storage facilities. With storage houses, these markets could be supplied with southern-grown potatoes throughout the season. The markets of the West will take the moister fleshed potatoes grown in the South, and a good trade could be built up in this region if the growers would use greater care in grading and packing.

While the varieties of sweet potatoes now grown in the South are preferred by the southern people, the dry, mealy roots sell best in the markets of the North. The grower should aim to give the consumers what they want, and for northern markets the dry or semimoist varieties should be grown, regardless of the grower's preference.

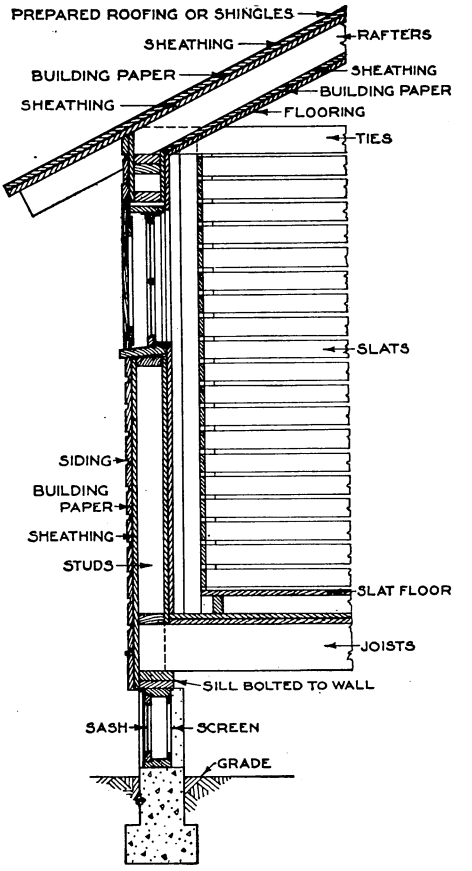

FIG. 11.—Details of the foundation, floor, wall, and roof construction of a sweet-potato storage house

HARVESTING SWEET POTATOES

Careful handling is one of the essentials in keeping sweet potatoes, and there is no more important place to practice it than in the field at digging time. The implement used to dig sweet potatoes should be one that does not cut or bruise the roots. One of the best types of diggers is a plow with rolling colters on the beam to cut the vines and with rods attached to the moldboard to free the roots from the soil and vines (fig. 12). A "middle buster" is also a good implement for digging sweet potatoes. After the potatoes are dug they should be scratched out by hand and allowed to remain exposed long enough to dry. They should never be thrown from one row to another, thrown loose into the wagon bed, or put into bags. The digging should be done, if possible, when the weather is bright and the soil dry.

Sweet potatoes should be graded in the field, in order to reduce the cost of handling to a minimum. A good plan is to go over the rows and pick up the sound, marketable potatoes in one basket, then gather all the seed stock in another basket or box and put the injured ones in still another. These boxes or baskets should be loaded on a wagon

with springs and hauled direct to the storage house. If the potatoes are to be stored in baskets, boxes, or crates, the different grades should be put by themselves, and when stored in bulk they should be placed in separate bins. By following this method it will not be necessary to grade the potatoes at the storage house when putting them in. This will effect a saving of time, reduce the loss by decay, and save the cost of extra handling. The potatoes should be emptied into the bins as carefully as possible, to prevent bruising. Sweet potatoes can be stored in boxes, hampers, baskets, or bins with satisfactory results. The preference of the individual grower will determine the method to be employed.

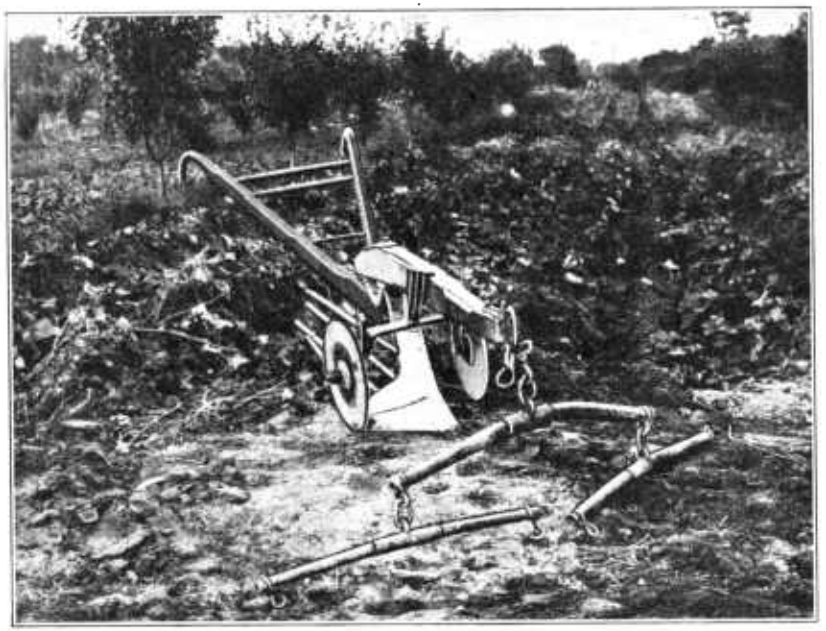

FIG. 12.—A type of digger with rolling colters attached to the beam, often used for digging sweet potatoes

Each year, after the sweet potatoes have been marketed, the storage house should be thoroughly cleaned and disinfected before it is used again. All dirt and refuse should be cleaned out and all parts of the interior sprayed or washed thoroughly with a solution of formalin (1 pint of formalin to 10 or 15 gallons of water). Diseased roots should not be thrown on the manure pile or on land to be used for sweet potatoes; the safest plan is to burn them.

CRATE STORAGE

Where crates are used, a slat floor raised 4 inches from the main floor should be provided, in order to allow air circulation under the crates, and they should be stacked in even rows to the height of 8 feet. A satisfactory method is to stack each row of crates on two 2 by 4 inch pieces set on edge, parallel to each other, and about 1 foot apart, thus permitting ventilation under the crates and acting as a substitute for the slat floor. This is important in order to protect the potatoes in the first row of crates.

FILLING THE BINS

In filling the storage house, the workmen should begin at the back end of the bins and pour a layer of sweet potatoes about 2 feet deep in all of the bins rather than fill one bin at a time. If the bins are 8 or 10 feet long, it is a good plan to divide them into two parts. By nailing cleats to the middle support of the bins, as shown in Figures 4 and 6, the partition can be raised as the bins are filled. The partition boards should have some space between them to allow free circulation of air. A 1-inch block between the boards will be satisfactory to separate them. By dividing the bins in this way, the back of the bin can be filled without climbing over the potatoes in the front part. When taking the potatoes out, those in one section of a bin can be removed without disturbing the remainder. This is very important where they are sold in small quantities.

CURING SWEET POTATOES

While the newly dug sweet potatoes are being brought in, a fire should be kept in the storage house to dry off the moisture. A temperature of 80° to 85° F., with plenty of ventilation, should be maintained for 10 days or two weeks, depending on weather conditions and the variety of potatoes. Ventilation is absolutely necessary, and even if it is not possible to keep the temperature up to 80° F., it is necessary to leave the doors, windows, and ventilators open, so as to drive out the moisture-laden air. The doors and windows may be closed at night and should be kept closed on cloudy days. Some of the ventilators in the floor and through the ceiling should be kept open throughout the curing period, even in cloudy or rainy weather. The air inside the house should be kept warmer than the outside air during the curing period. This will prevent moisture from being deposited on the walls. As the air warms, it expands and takes up moisture. When it cools it contracts and gives up its moisture. This makes it important to get the moisture-laden air out of the house by ventilation. When the potatoes are thoroughly dried or cured, the temperature should be gradually reduced to 55° F. and kept as near that point as possible during the remainder of the storage period. If the temperature goes below 48° F., a fire should be made and the temperature raised to 55° F. When the temperature goes above 60° F., the house should be opened in the cool of the day to lower the temperature to 54° or 55° F., and then closed. In mild weather the ventilators in the roof may be partly open all the time, but they should be closed in cloudy or cold weather.

METHODS OF HEATING A STORAGE HOUSE

A small house can be heated with a sheet-iron stove that will burn knots and other pieces of wood. Coal stoves may be used if preferred, but air-tight wood stoves will serve the purpose. It requires a longer time to get up heat with a coal stove than with a wood stove, and this is one disadvantage in using coal. Often all that is necessary to raise the temperature a few degrees is to start a little wood fire. In a commercial storage house a hot-air heater or a hot-water boiler, with pipes around the walls, would be prefer-

able to a stove, but a house that will hold as many as 10,000 to 25,000 bushels of sweet potatoes may be heated with good stoves. The location of the stoves in the house depends on the size of the house and the direction of the cold winds. Ordinarily, where one stove is used, it is placed near the center of the house, but if the cold wind strikes one end the stove should be in that end. The larger houses have a stove in each end, but in cases where the house is divided into rooms it is necessary that a stove be placed in each room. Considerable open space should be left around the stoves to prevent the potatoes from being injured by excessive heat. In large houses it is desirable to put in partitions to make separate rooms. Each room should have a stove or other independent heating unit. Small storage houses are sometimes heated with oil stoves with satisfactory results. In most sections of the South it is not necessary to keep heat in the storage house much of the time. It is only necessary to build a

FIG. 13.—A pile of sweet potatoes ready to be covered with cane tops and soil. Note the ventilating hole which extends through the center of the pile

fire when the temperature in the house goes below 48° F. or during wet weather, when moisture is likely to deposit on the walls. When the outside temperature goes to 60° F. or above during the day, the house may be opened for a few hours, provided the atmosphere is fairly dry, in order to raise the temperature inside to the desired point. When the temperature reaches 55° F. the house should be closed. By giving close attention to opening and closing the house, very little artificial heat will be needed in the lower South after the curing period.

STORAGE PITS AND CELLARS

Storage in banks and pits is sometimes necessary, and the best methods of storing in them and in outdoor cellars are here described. The main disadvantages in the pit or bank method of storage are (1) the large proportion of loss due to decay; (2) the inferior quality of the sound potatoes, due to lack of proper curing; (3) the loss on the market, because banked potatoes will keep for such a short period after being removed; and (4) the inconvenience of getting

the potatoes when needed, especially during cold or rainy weather. If it is impossible to build a storage house the potatoes should be cared for in some other way, and it is much better to store in pits or outdoor cellars than not to store them at all. By using the best

FIG. 14.—A number of sweet-potato banks, illustrating the method of ventilation by the use of troughs at the top of each pile

methods of banking known, the loss by decay can be materially reduced but not eliminated, because it is impossible to control the moisture and temperature.

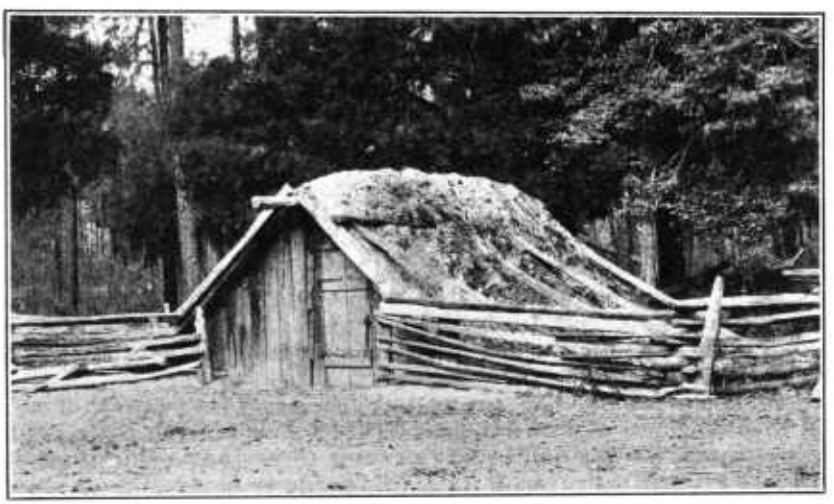

FIG. 15.—A type of outdoor cellar used in some sections of the South for storing sweet potatoes. This structure should have openings near the bottom and through the top for the purpose of ventilation

Storage pits should be located where the drainage is good. In making a pit a little of the surface soil is thrown back to form a level bed of the size desired. It is a good plan to dig two small trenches across the bed at right angles to each other to provide for ventilation

at the bottom. Lay boards or place troughs over the trenches, and at the point where the trenches cross set a small box on end to form a flue up through the pile of potatoes, as shown in Figure 13. The earth floor of the pit is covered with 4 or 5 inches of straw, hay, leaves, or pine needles, and the potatoes are placed in a conical pile around the flue. A covering of straw, hay, or similar material is put on the pile and over this a layer of soil. The covering of soil should be only a few inches thick at first but increased as the weather gets cold. Keep the ends of the trenches and flue open until it is necessary to close them to keep out the frost. It is better to make several small pits rather than one large one, because it is best to remove the entire contents when the pit is opened. Figure 14 shows a number of pits with a trough ventilator placed over the top of each pile of potatoes.

A type of storage cellar similar to the one shown in Figure 15 is often used in the South for storing sweet potatoes. This form of

FIG. 16.—Hampers of sweet potatoes separated into two grades. This type of package is used at considerable extent by growers in New Jersey

storage is much better than pits or banks. The potatoes can be cured in the outdoor cellar, and it is easier to get them out when wanted for the table or for market. A good type of outdoor cellar can be made as follows: Set a line of posts for the center supports and on these posts put a ridgepole. Against the ridgepole place one end of planks, poles, or slabs, with their opposite ends resting on the ground on either side. The ends of the inclosure are boarded up, a door being provided in one end. The structure is covered with sod to a thickness of 5 or 6 inches. It is a good plan to put a ventilator through the top and to leave two or three openings in the sides near the ground. Provision should be made to close all these openings during cold or wet weather. By placing a small stove in the storage cellar the potatoes can be cured in the way that has been described for the storage house. The potatoes are usually piled on a layer of straw, leaves, or pine needles placed on the ground. A better method is to build a slat floor a few inches from the ground and pile the potatoes on the floor. This floor will allow the circulation of air under the potatoes, which will aid in curing them.

MARKETING SWEET POTATOES

One reason why southern farmers have not received better prices for sweet potatoes is that they have not used proper methods of handling and marketing. In many cases the potatoes are badly bruised and cut in digging, put in bags or rough barrels without grading, and rushed to market when there is an oversupply. The secrets of success in getting high prices are to carefully grade, clean, and pack the product and to put it upon the market when there is a good demand. The greatest demand for sweet potatoes is, as a rule, from the middle of December to the middle of March.

When the potatoes are to be marketed they must be carefully graded, no matter how well the grading had been done when they were put in the house. The market demands a medium-sized uniform type of sweet potato, free from bruises or decayed spots. In grading, the large, overgrown, crooked, broken, or bruised roots should be kept at home for feeding or for canning. The best potatoes will bring a higher price when separated from the culls.

After careful grading, the sweet potatoes should be put in clean, neat, attractive packages. Bags should never be used, as the potatoes in them become badly bruised when handled. The standard veneer potato barrel with a burlap cover is often used in summer or autumn, but for winter shipment the double-headed stave barrel or tight box is used. The smaller type of package, such as the bushel hamper (fig. 16), bushel box, or basket, is becoming more popular each year. A neat and attractive package of well-graded potatoes will bring a good price at almost any time, even when the market is overstocked with inferior goods.

Sweet potatoes when shipped during the winter must be protected from the cold. When a potato becomes chilled its quality is impaired, and decay soon follows. In cold weather the package should be covered with paper and the cars heated, in order to prevent chilling the potatoes. Some shippers find it an advantage to line their baskets and barrels with paper. For more complete information on packing, shipping, and marketing sweet potatoes, see United States Department of Agriculture Bulletin 1206, "Marketing Southern-Grown Sweet Potatoes."

PUBLICATIONS ON SWEET POTATOES

Sweet-Potato Growing (Farmers' Bulletin 999).
The Sweet-Potato Weevil and Its Control (Farmers' Bulletin 1020).
Sweet-Potato Diseases (Farmers' Bulletin 1059).
Utilization of Flue-Heated Tobacco Barns for Sweet-Potato Storage (Farmers' Bulletin 1267).
United States Grades for Sweet Potatoes. Recommended by the United States Department of Agriculture (Department Circular 99).
Eradication of the Sweet-Potato Weevil in Florida (Department Circular 201).
Group Classification and Varietal Descriptions of American Varieties of Sweet Potatoes (Department Bulletin 1021).
A Study of Sweet-Potato Varieties, with Special Reference to Their Canning Quality (Department Bulletin 1041).
Sweet-Potato Storage Studies (Department Bulletin 1063).
Production of Sirup from Sweet Potatoes (Department Bulletin 1158).
Marketing Southern-Grown Sweet Potatoes (Department Bulletin 1206).

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